

## ABSTRACT

5 A system, amplifier and method are provided for  
amplifying an optical signal in an optical  
communications system where spans between amplifiers  
may vary. The system includes a Raman amplifier  
variable gain portion and an EDFA gain portion. The  
amount of Raman amplifier gain is chosen to trade off  
accumulation of noise with accumulation of multi-path  
10 interference. This variable Raman gain is used to  
equalize the loss of each span so that the amount of  
optical power supplied at the input of the EDFA gain  
portion is substantially constant throughout the  
system.

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